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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,528	11/03/2005	Ronald Kakoschke	10808/208	8779
48581 7590 07/03/2008 BRINKS HOFER GILSON & LIONE/INFINEON INFINEON PO BOX 10395 CHICAGO, IL 60610				
EXAMINER SALERNO, SARAH KATE				
ART UNIT		PAPER NUMBER		
2814				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/521,528

**Applicant(s)**

KAKOSCHKE ET AL.

**Examiner**

SARAH K. SALERNO

**Art Unit**

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 8-10 and 13-22 is/are pending in the application.  
4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☐ Claim(s) 1-6 and 8-10 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 13 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date 01/13/05.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I: claims 1-6 & 8-10 in the reply filed on 04/21/08 is acknowledged.
2. Claims 13-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/20/07.

### ***Specification***

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the channel region lies along an entire periphery of the hole (claim 5) or the channel region lies only on one side of the trench (claim 6) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Hueting et al. (WO/01/69684 A2).

Claim 1: Hueting teaches a field-effect transistor: having a doped channel region (15) arranged along a depression (20), having a doped terminal region (13) near an opening of the depression, having a doped terminal region (14) remote from the opening, having a control region (11) arranged in the depression, and having an

electrical insulating region (22) between the control region (11) and the channel region (15),

the terminal region (14) remote from the opening leading as far as a surface containing the opening or being electrically conductively connected to an electrically conductive connection leading to the surface, the field-effect transistor being a drive transistor at a word line or at a bit line of a memory cell array, the field-effect transistor comprising only one depression in which the control region is arranged.

Claim 2: Hueting teaches the terminal regions contain the same dopant concentration and dopants of the same conduction type (pg 4 lines 24-25 & pg 7 lines 15-17).

Claim 3: Hueting teaches the channel region (15a) has a length corresponding to at least two thirds of a depth of the depression (FIG. 1).

Claim 4: Hueting teaches the depression is a trench or a hole (Page 4 line 28).

Claim 5: Hueting teaches the channel region lies on opposing sides of the trench or along an entire periphery of the hole (FIG. 1).

Claim 8: Hueting teaches the depression for the control region and a depression filled with an electrical insulating material between the field-effect transistor and an adjacent electrical component have the same depth (FIG. 1).

Claim 10: Hueting teaches wherein the insulating region has an insulating thickness of at least 15 nm (page 7 lines 18-20)

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 9 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hueting et al. (WO/01/69684 A2) as applied to claim 1 above, and further in view of Degawa et al. (EP 0872895).

Regarding claim 9, as described above, Hueting substantially reads on the invention as claimed, except Hueting does not teach the depression for the control region has a smaller depth than a depression filled with an electrical insulating material between the field-effect transistor and an adjacent electronic component. Degawa teaches the depression for the control region (14) has a smaller depth than a depression filled with an electrical insulating (12) material between the field-effect transistor and an adjacent electronic component to stabilize performance (Col. 2 lines 5-10). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device taught by Hueting to have the depression for the control region has a smaller depth than a depression filled with an electrical insulating material between the field-effect transistor and an adjacent electronic component to stabilize performance as taught by Dagawa (Col. 2 lines 5-10).

Claim 6: Degawa teaches the channel region lies only on one side of the trench or only along part of a periphery of the hole (FIG. 1).

Claim 20: Degawa teaches at least one of: a distance between the terminal regions along the depression is at least  $0.4\text{ }\mu\text{m}$ , and at least one terminal region has a shallow doping profile gradient which permits a switching voltage having a magnitude of greater than 9 volts but less than 30 volts (FIG. 1)

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH K. SALERNO whose telephone number is (571)270-1266. The examiner can normally be reached on M-R 7:30-5:00pm every other F 7:30-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. K. S./  
Examiner, Art Unit 2814

/Theresa T. Doan/  
Primary Examiner, Art Unit 2814